

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 2008		2. REPORT TYPE		3. DATES COVERED 00-00-2008 to 00-00-2008	
4. TITLE AND SUBTITLE Future Combat Systems (Brigade Combat Team) Joint Multinational Experimentation				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Army Acquisition, Logistics & Technology (AT&L),9900 Belvoir Road Suite 101,Fort Belvoir,VA,22060-5567				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 3	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Future Combat Systems (Brigade Combat Team) Joint Multinational Experimentation

MAJ Troy Crosby, Charlene Deakyne and Scott Schnorrenberg

As the weather clears at the Nevada Test and Training Range, Soldiers, government personnel and contractor partners begin to bring the Future Combat Systems (FCS) equipment and network online. The team works quickly getting the unattended ground sensors, mobile ad hoc network and vehicles ready to execute the experimentation mission plan. Connections from the FCS Brigade Combat Team (BCT) to the Combined Forces Land Component Command (CFLCC), the U.S. Navy (USN) Maritime Operations Center and the U.S. Air Force (USAF) Combined Air and Space Operations Center must be ready to pass situational awareness (SA), Joint fires requests, and intelligence, surveillance and reconnaissance (ISR) information. This is just another typical day for the FCS Experimentation Team during a phase of the Joint Expeditionary Force Experiment (JEFX) 2008.



Here, two networked High-Mobility Multipurpose Wheeled Vehicles are tested during FCS Experiment 1.1. (U.S. Army photo courtesy of FCS(BCT).)

Soldiers work with the network in a manned ground vehicle mock-up. (U.S. Army photo courtesy of FCS(BCT).)



The FCS Joint and Multinational Experimentation Team is comprised of representatives from the U.S. Army FCS(BCT) Joint, Interagency and Multinational Interoperability (JIMI) Product Office, the Lead Systems Integrator (Boeing Co. and Science Applications International Corp.) and the One Team Partners — all working together to accomplish FCS experimentation goals. The main focus for the FCS Experimentation Team is to provide insight to one of the FCS program's greatest assets to the Army — its integrated, interoperable and highly capable network system. The FCS network will be a major component of the JEFX 2008.

The JEFX 2008 is the seventh in a series of USAF experiments providing a multidimensional, multinational, multiservice environment for the end-to-end exploration, assessment and transition of Joint and coalition warfighter capabilities. The JEFX series of experiments focuses on Joint Air Operations including close air support, air defense, air operations planning, airspace management, target list generation and sensor sharing. JEFX combines live air, space, naval and ground forces; operational concepts; and technologies for enhancement of capabilities in a collaborative environment.

In March 2006, the FCS program submitted an initiative titled "FCS Network Integration and Joint Interoperability" to the USAF-sponsored JEFX. The USAF identified six operational focus areas addressed during the experiment. The FCS initiative is linked with two of these: Joint Forces Component Commander-ISR Global Management and Global Force Readiness Management.

FCS will exploit evolving enterprise services to provide near-real-time Soldier access to critical SA and effectors. The team will conduct Joint Networked Fires using a family of networked sensors to provide enhanced Soldier protection and lethality while preventing fratricide. Experimentation results will be used to assess the current state of FCS network integration and interoperability, reducing related risks to the FCS Program of Record, and helping to refine evolving doctrine and training support products. Proven FCS technology will be provided to global war on terrorism warfighters through scheduled spin outs (SOs) beginning in 2008.

The FCS initiative plan for JEFX 2008 builds upon previous FCS experimentation in JEFX 2006, which involved dissemination of SA and support to time-sensitive targeting. The FCS initiative will improve network integration and Joint interoperability through warfighter collaboration and connectivity. FCS experimentation includes the network's five layers, and integrates distributed common ground System-Army, Army Aviation and Space, and 10 to 12 networked nodes with manned ground vehicles (surrogates). It also includes unmanned air systems, integrating with USAF

platforms and networks focused on the "live fly." The execution of technical threads includes Joint Networked Fires and Airspace Management, and employs Net-centric Enterprise Services.

In JEFX 2008, FCS will focus on using unmanned aerial vehicles as a sensor and communications relay in a Joint airspace constrained environment. The FCS Experimentation Team will also test and demonstrate data and information transfer, communications interoperability, operational procedures, operational situation understanding and warfighter machine interface functionality. JEFX 2008 also provides FCS interoperability with the USAF, U.S. Marine Corps (USMC), USN and United Kingdom (U.K.) forces.

During JEFX 2008-1's execution in November 2007, FCS operated systems from a Boeing Facility in Huntington Beach, CA; Fort Monmouth, NJ; and Langley Air Force Base (AFB), VA. Distributed site connectivity was achieved via secure domain. FCS distributed SA via the Global Information Grid, developed a Joint common operating picture and conducted strike missions using elements within the USMC, USAF Tactical Air Control Party, CFLCC and Air Support Operations Center. JEFX 2008-1 was a lab-based demonstration but will transition



A Soldier tests the network during Experiment 1.1. (U.S. Army photo courtesy of FCS(BCT).)

to a field experiment focused on live fly in JEFX 2008-2 and 2008-3.

The FCS experimentation goal is to explore the benefits of service-oriented architectures (SOAs) and to learn more about how different Joint/multinational architectures can interoperate. To achieve this, FCS is participating in several experiments concurrently, including JEFX 2008, Joint Limited Technical Experiment (LTE) and the Coalition Warrior Interoperability Demonstration (CWID).

Joint LTE

The Army FCS(BCT) Network Systems Integration Program Manager, U.S. Naval

Warfare Development Command and the USAF Electronic Systems Center (ESC) supported participation in a Joint LTE in August 2007. The LTE was a distributed event executed by the Network Analysis Integration Lab from Fort Monmouth; Space and Naval Warfare Systems Command out of San Diego, CA, and Charleston, SC; Naval Air Warfare Center, China Lake, CA; and ESC, Hanscom AFB, MA. The SOA LTE's overarching objective was the performance and interoperability of the Consolidated Afloat Network Enterprise Services and Consolidated Network-centric Data Environment reference implementations in a tactical environment with FCS. The LTE integrated the two service-oriented environments for Joint data exchange. The lessons learned suggest numerous avenues for further FCS experimentation.

CWID

In October 2007, an FCS trial submission was selected for participation in the 2008 CWID that will be conducted

in June 2008. The CWID is the Chairman of the Joint Chiefs of Staff's annual event enabling civilian and military authorities to discover and investigate command, control, communications, computers, ISR (C4ISR) solutions focusing on relevant and timely objectives for enhancing interoperability and information sharing between agencies.

The CWID focuses on net-centric solutions to identify C4ISR gaps that the traditional DOD acquisition process is not addressing.

The FCS Interoperability Trial will support the CWID objective to improve coalition and Joint C4ISR architecture.

In its first CWID as a participant, FCS intends to exchange Blue and Red SA data with the U.K. command and control systems and publish this same information to higher headquarters echelons on the CWID network. Collaboration applications will be employed between FCS and U.K. systems to aid in fires mission management. The initial demonstration builds a foundation for future experimentation and cooperation between FCS and the U.K. acquisition organizations.

The purposes of FCS experimentation are to assess program risk mitigation, prove out research and development progress (maturity) of specific network-centric hardware and software items, and ensure interoperability between Joint, Current and Future Forces operating in an ad hoc, mobile network. Participation in JEFX 2008, the Joint LTE and CWID provides an early opportunity to assess progress on a set of FCS platforms and network products integrated for use in a laboratory and

field environment. These experiments provide high payoff in the form of knowledge, insight and understanding in support of FCS program execution and the capabilities SO to the Current Force. The leveraging of experimentation allows early integration of developmental platforms, network hardware and software, and tactical satellite communications for the program, allowing delivery of FCS capabilities to the Army. The bottom line for the FCS Experimentation Team is it provides insight to one of the greatest assets of the FCS program to the Army: its integrated, interoperable and capable network system as a lethal weapon for our current and future warfighters.

MAJ TROY CROSBY is an FCS(BCT) program Joint Assistant Product Manager assigned to the JIMI Product Office. He is the lead for the FCS(BCT) Network System Integration Program Office for JEFX 2008. Crosby holds a B.A. in business administration from James Madison University, an M.B.A. from Webster University and an M.S. in information systems technology from the George Washington University. He is an Army Acquisition Corps member certified Level II in both information technology and program management.

CHARLENE DEAKYNE is a defense contractor working for the FCS(BCT) JIMI Product Office and supporting the FCS JEFX 2008. She holds a B.S. in mathematics from the University of Alabama and an M.S. in computer science from the University of Alabama-Huntsville.

SCOTT SCHNORRENBURG is a defense contractor working for the FCS(BCT) JIMI Product Office. He is the lead technical engineer for JEFX 2008. Schnorrenberg holds a B.A. in psychology from Auburn University.